1.0 INTRODUCTION

The Coeur d'Alene Mining District is located within the Coeur d'Alene River basin in the eastern portion of the panhandle of northern Idaho (Figure 1-1). Mining in the district began more than 100 years ago. The district has been one of the leading lead-, zinc- and silver-producing areas in the world, with production of approximately 1.2 billion ounces of silver, 8 million tons of lead, and 3.2 million tons of zinc (Long 1998). Mining, milling, and smelting practices used in the district have resulted in substantial portions of the basin being contaminated by hazardous substances. The contamination resulted from the discharge or erosion of mill tailings and other mine-generated waste into the Coeur d'Alene River system and its tributaries (Figure 1-2).

The quantities of tailings discharged to the Coeur d'Alene River constitute a substantial amount of material. Estimates of the total amount of tailings discharged to the South Fork Coeur d'Alene River and its tributaries range from 54.5 to more than 70 million tons, depending on the source (Long 1998; Mine Systems Design, Inc., as cited in Shoshone Natural Resources Coalition 2000; MFG 1992). A 1998 estimate of 61.9 million tons developed by the U.S. Geological Survey (Long 1998) is believed to be the most accurate and falls near the midpoint of the range of estimates. Assuming that 1 cubic foot of tailings weighs approximately 125 pounds, if all the tailings discharged to the river were piled on a football field (approximately 100 yards by 50 yards), the pile would reach more than 4 miles high. Recognizing that the mining waste discharged to the river has been commingled with clean sediment, which then itself becomes contaminated, the total amount of contaminated material in the Basin is significantly greater than 61.9 million tons. These mill tailings and other mine-generated waste contained metals, such as cadmium, lead and zinc. Exposures to high concentrations of such metals have been associated with adverse impacts to human health and the environment.

In 1998, the U.S. Environmental Protection Agency (EPA) initiated a remedial investigation/ feasibility study (RI/FS) of mining-related contamination in the Coeur d'Alene Basin. This report presents the results of that remedial investigation. The study excludes an area known as the Bunker Hill Superfund site, which was previously investigated by EPA, but evaluates broad impacts on the river through the BHSS. The BHSS remedy explicitly excluded metals in the Coeur d'Alene River, although it was expected that remedial actions conducted at the site would improve water quality in the River. The basin, as evaluated in the remedial investigation, includes the Coeur d'Alene River and associated tributaries (including portions that run through the BHSS), Coeur d'Alene Lake, and the Spokane River downstream to the Washington State

Highway 25 bridge at Fort Spokane on the Spokane Arm of Lake Roosevelt. Collectively, this area is referred to as the Coeur d'Alene Basin.

1.1 PROJECT SCOPE AND REPORT ORGANIZATION

The Coeur d'Alene Basin remedial investigation follows an earlier RI/FS conducted in the basin. The earlier RI/FS focused on a 21-square mile area known as the Bunker Hill Superfund site. The BHSS RI/FS was completed and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Records of Decision (RODs) written in 1991 and 1992. Remedial actions under the two BHSS RODs are currently being implemented, largely addressing areas impacted by smelter operations. Actions under the BHSS RODs are expected to reduce the release of metals into the South Fork as it flows through the BHSS.

After issuance of the first two BHSS RODs, information from a variety of sources indicated broader impacts from mining contamination were present in the basin. This led to concern over risks to human health within residential communities and recreational areas and risks to ecological receptors such as fish and waterfowl outside the BHSS. To evaluate these impacts and risks in a comprehensive manner, EPA initiated the Coeur d'Alene Basin RI/FS in early 1998. EPA contracted with URS Greiner, Inc., and CH2M HILL to conduct the RI/FS, in partnership with the Coeur d'Alene Tribe, State of Idaho, State of Washington, and other federal, state, tribal and local agencies.

The geographic area evaluated in the Coeur d'Alene Basin RI/FS is included in the Bunker Hill Mining and Metallurgical complex facility that was added to the National Priorities List (NPL) in 1983. In September 1998, a federal district court judge ruled that this NPL facility was limited to the 21-square-mile area known as the Bunker Hill Superfund site *(U.S. v. ASARCO Inc.*, 28 F.Supp.2d 1170). However, this ruling was vacated on appeal in the Ninth Circuit Court of Appeals, leaving EPA's view that the Coeur d'Alene Basin is included in the Bunker Hill Mining and metallurgical complex facility. Inclusion on the NPL is not a precondition for the conduct of an RI/FS, pursuant to Section 104(b)(1) of CERCLA, 42 U.S.C. 1 9604(b)(1). See also NCP 40 CFR Part 300.425(b)(1).

To identify potential risks to human health and ecological receptors, the RI report summarizes data and analyses on the nature and extent of mining contamination in the basin. Data have been collected and analyses conducted through the RI/FS CERCLA process, 42 U.S.C. 9601 et seq., and the implementing regulations in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. The information presented in this RI report is used

in the human health risk assessment (HHRA), ecological risk assessment (EcoRA), and feasibility study (FS).

To ensure opportunities for stakeholder involvement, EPA has accomplished the following:

- Prepared a Community Involvement Plan (USEPA 1999)
- Established an Administrative Record file and local information repositories
- Conducted or participated in dozens of public meetings and interviews in local communities
- Prepared and distributed fact sheets, established a web page, and circulated for public review draft documents, such as numerous field sampling plans and the technical work plan for the Bunker Hill Basin-Wide RI/FS (USEPA 1998)

The content and organization of this report are based on EPA's *Guidance Document for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final* (USEPA 1988).

The remedial investigation report is divided into seven parts:

- Part 1—Setting and Methodology
- Part 2—Remedial investigation results for Conceptual Site Model (CSM) Unit 1, Upper Watersheds
- Part 3—Remedial investigation results for CSM Unit 2, Midgradient Watersheds
- Part 4—Remedial investigation results for CSM Unit 3, Lower Coeur d'Alene River
- Part 5—Remedial investigation results for CSM Unit 4, Coeur d'Alene Lake
- Part 6—Remedial investigation results for CSM Unit 5, Spokane River
- Part 7 (**this part**)—Summary of the remedial investigation, which includes a summary of the regional physical setting (geology, geochemistry, hydrogeology,

hydrology, ecology, and demographics) and basinwide study results for soil/sediment, groundwater, and surface water

Risk evaluations and potential remedial actions associated with source and depositional areas are described under separate cover in the human health risk assessment, the ecological risk assessment, and the feasibility study.